MEMORANDUM

DATE:	March 28th, 2016
FROM:	Eric Lancaster
SUBJECT:	March Weekly Progress Report @ Gold King
TO:	Steven Way

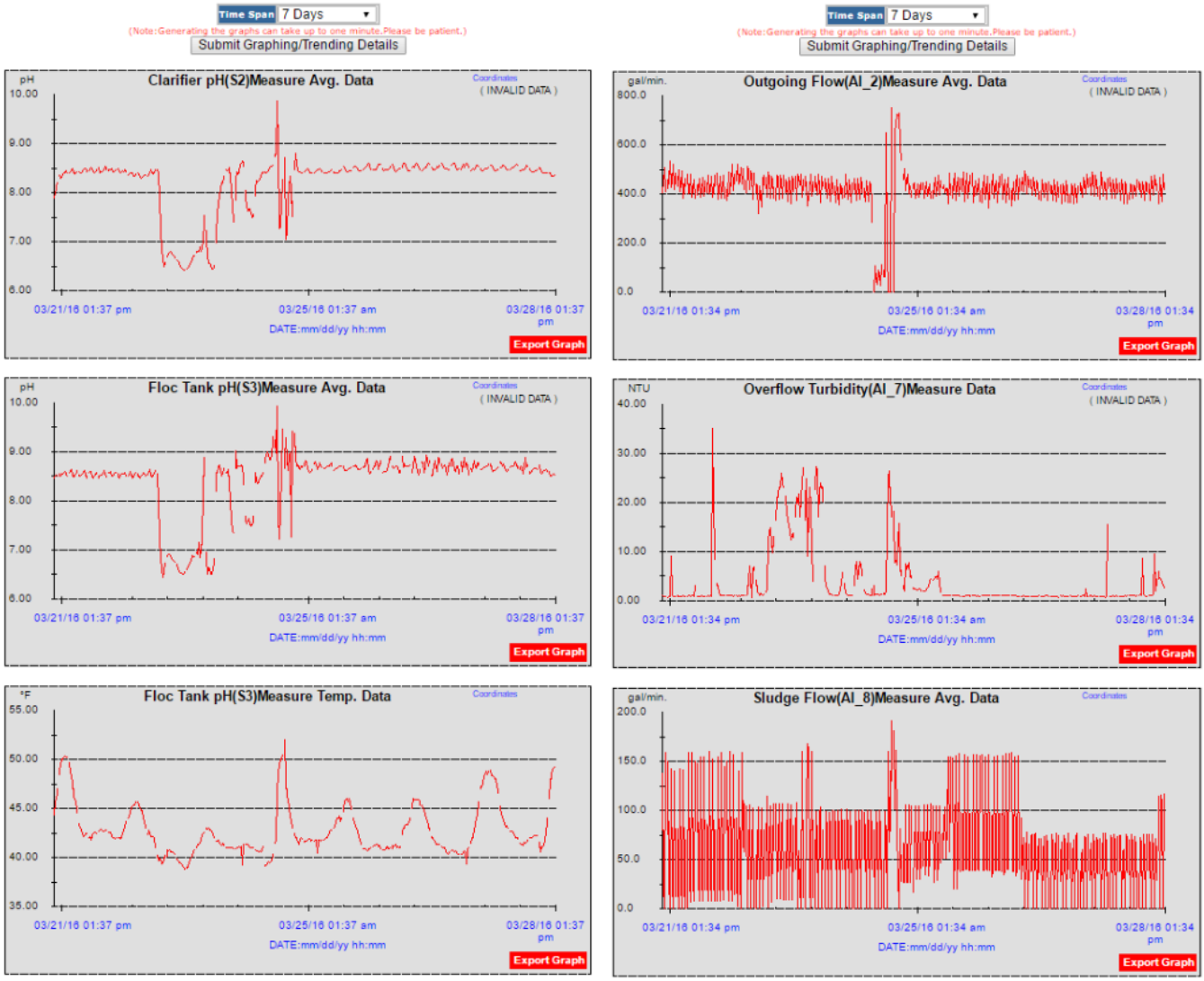
Project: Gold King Interim Water Treatment Plant (IWTP)
Location: Gladstone, Colorado
Prepared for: Emergency Response Unit – US EPA Region 8

Reporting Period: Mar 21 – Mar 28
Report No.: 14

I. General Operations Summary:

IWTS Function/Upsets

- The following graphs provide trending information collected by datalogging equipment during the previous 7 days. These dataloggers collect control information from the Lime Circuit (left) and Flow Circuit (right) Programmable Logic Controllers (PLCs) at the Gold King IWTP. Over the reporting period (3/21/16 – 3/28/16 inclusive) Alexco treated 4.21 million gallons at an average flow rate of 418 gpm with all discharged treated water leaving the 12" HDPE pipeline.



- On 3/22/2016, Alexco experienced a partial plug on the lime slurry peristaltic pump's incoming line. This pump delivers lime slurry to the reactor tank. The plug affected both the A and B pumps, and by limiting flow kept the pH lowered in the reactor tank to between 6.5 and 7.0 SU. During the evening of 3/23/2016, efforts were completed to raise the pH above 8.0 SU, and on 3/24/2016 the discharge lines from the Slurry Tank were modified to by-pass the plugging issue and return the system to normal operation. It should be noted that the plugging issue was caused by a build-up of solids at the bottom of the tank that plugged both pump's intakes which are 6" above the tank's floor. The pump intake piping system has been modified to pull slurry roughly 3' from the floor of the tank, over the top, and down to the pump. Alexco will schedule a vac-truck (Badger) to remove the collected solids in the near future.
- On 3/24/2016, Alexco shut-down the intakes to the IWTP and backed-up water in Pond 2. Water was then released at increasing flow rates to test the outgoing flow meter, inspect the lime addition system, and monitor turbidity. During this testing, the outgoing flow meter performed well up to 950 gpm, at which time it is unable to monitor increasing flow rates due to entrained air. 2" and 3" HDPE saddles will be installed in the near future to release the entrained air on the discharge side, and allow for the installation of the incoming flow meter immediately upstream of the clarifier.

Communication System Function Status

- No issues – reliable operations during the reporting period.

Facility or System Related Work, including Repairs & Completions

- N/A

II. Identified Problems, Causes, and Solutions (Planned or Implemented)

- **Electrical Permit Closure** – Alexco has preliminarily scheduled Precision Electric and Durango Electric to begin making electrical updates/changes at the IWTP starting 4/4/2016 based on an e-mail from Don Nowlin dated 2/22/2016. This e-mail lists the following issues:
    - Cable tray shall be listed
    - Cords/cables installed in tray shall be listed for such use
    - Cords shall be installed with strain relief
    - Cords/cables shall be protected/secured between tray and equipment
- **Installation of Incoming Flow Meter** – Alexco will re-install the incoming flow meter on the 12" HDPE pipeline near the clarifier.
- **Discharge flow meter malfunction** – Alexco discovered that at flow rates above 950 gpm the discharge flow meter malfunctions. It is assumed that an excessive amount of entrained air is causing issues with the magmeter, and additional saddles/vents will be installed to mitigate the issue.
- **Valve Shut-off** – The Alexco operators can easily access two 8" butterfly valves that control the incoming flow rate to the IWTP. It was discovered these valves cannot be completely shut, and instead allow water to leak past at roughly 50 to 75 gpm. It is believed that build-up, fibers, or other material is causing a blockage and the valves require maintenance in the near future.
- **Stress Test** – Without accurate incoming and/or outgoing flow meters that can measure rates above 950 gpm, the IWTP stress test is delayed. This test will be rescheduled.
- **Excessive Sludge** –Roughly 12" to 18" of thick sludge was identified at the bottom of Ponds 1 and 2. Alexco and ER need to consider possible removal options prior to spring runoff.
- **Spring Melt Contingency Planning:**
    - **Thickener/Clarifier** - Alexco is currently considering options to thicken the sludge that is collected from the existing clarifier and sent to the bags for dewatering. It is estimated that the current slurry is comprised of 0.5% - 0.75% solids at a flow rate between 35 to 60 gpm average. With the installation of a thickener/clarifier, the discharge rate could be reduced to between 5 to 20 gpm average with solids averaging between 1% and 3%.

- **Additional Bags** – Alexco has purchased additional textile bags (2X 125' x 45 and 1X 90' x 45') that are currently located at site and can contain up to 2,000 CY of sludge. Alexco is planning to install one or two of these additional textile bags if needed prior to or during spring melt depending on access and snow cover. These new bags should demonstrate improved performance because of the improved quality of floc mixture and consistent dosing rate.
- **Additional Plans** – Additional contingency plans are currently under consideration.

III. System Inspections – Specific elements inspected and finding

- N/A

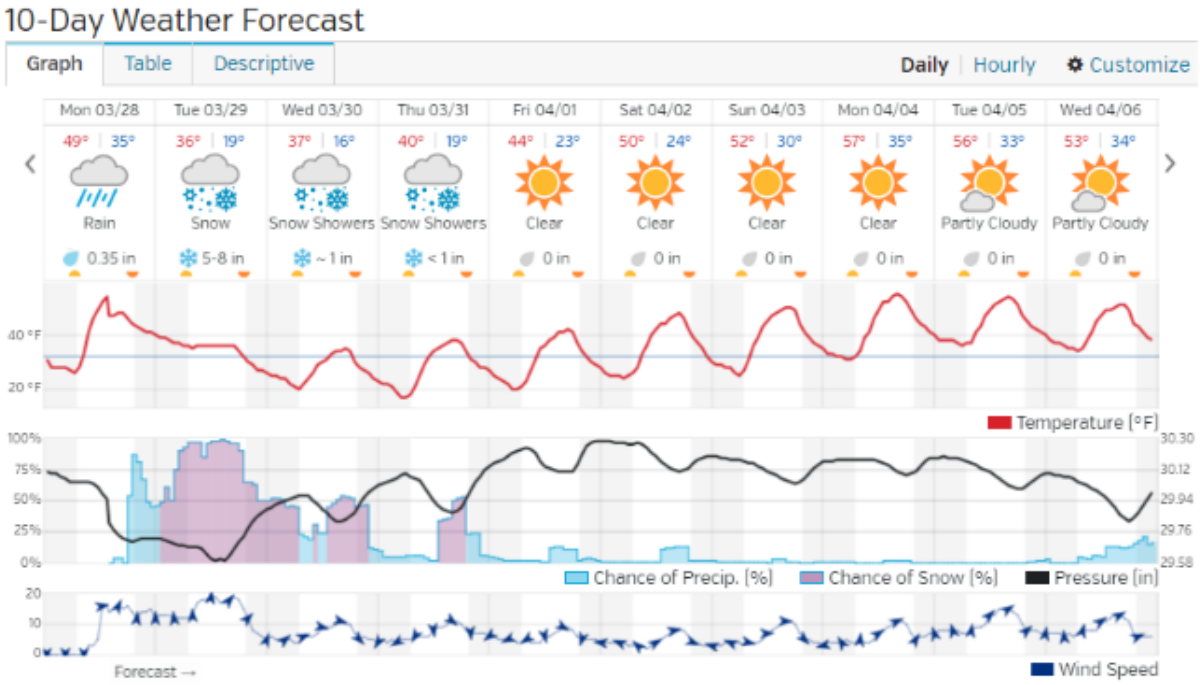
IV. Site Status

Personnel and equipment onsite

- On Tuesday, 3/22/2016 two of the local site operators resigned. Alexco currently employs one Full-Time Employee (FTE) who lives in Silverton and over-sees operations at the Gold King IWTP. He is supported by local contract equipment operators and remote oversight from Denver.

Weather conditions

- Weather Underground Report for Silverton, CO (3/23/2016 – 4/06/2016)



Site Images

Figure 1: Pond 2 levels rising during plant shut-down – Taken on 3/28/2016.